

CLIMBING PERCH (*ANABAS TESTUDINEUS*) (PERCIFORMES:
ANABANTIDAE) ON SAIBAI ISLAND, NORTHWEST TORRES STRAIT:
FIRST AUSTRALIAN RECORD OF THIS EXOTIC PEST FISH

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The Climbing Perch (*Anabas testudineus*) has been recorded from Sabai Island in the Torres Strait, marking the first Australian record for this potentially invasive noxious fish species. Its biology and ecology and invasive history are reviewed. Measures to prevent the spread of this fish by human vectors to the Australian mainland are discussed. □ *Anabas testudineus*, Climbing Perch, invasive fish, island colonisation, pest management, Saibai Island, Torres Strait.

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Climbing Perch, *Anabas testudineus* (Bloch, 1792), has been declared a noxious fish in Queensland under the *Fisheries Act 1994* (Qld). It is listed under Section 74 of the *Fisheries (Freshwater) Management Plan 1999*, as it 'is found in the waters of southern Papua New Guinea and could be considered a threat to Australian waters' (State of Queensland, 1999: 7). Until recently, no wild populations of the fish were known in Australia (Department of Primary Industries & Fisheries, 2005). Its presence has now been confirmed on Saibai Island (9°24'S, 142°41'E) in Torres Strait, far north Queensland.

On 25 November 2005 Mr Dugan Crothers, a water system engineer who regularly visits Saibai Island, observed several live Climbing Perch in a catchment pump near the island's dam. On 13 January 2006, he and a colleague, Mr Harry Yamashita, saw an individual fish 'walking' on the ground near the southwest end of the island's airstrip (Crothers, pers. comm., January 2006). Mr Yamashita photographed the fish (Fig. 1), and they passed the digital images to the Australian Fisheries Management Authority (AFMA) on Thursday Island. They in turn alerted the Queensland Department of Primary Industries and Fisheries (QDPI&F), the agency with responsibility for exotic pest fish. QDPI&F and the Queensland Museum subsequently confirmed the identification of the fish as Climbing Perch.

Following these reports, I travelled to Saibai Island in January 2006 in an unsuccessful attempt to secure a specimen, and to discuss aspects of its introduction and ecology with local people. Several Islanders quickly identified the fish from

photographs and drawings, stating that during the current wet season, numbers of Climbing Perch were seen moving overland within the village, especially during or immediately after heavy rain. One man said that he had first seen the fish on Saibai Island some three or four years ago, suggesting that a wild population of the fish has been established on the island for some time.

BIOLOGY AND PHYSIOLOGY

The Climbing Perch is an extremely hardy, small, brown or dark greenish-brown fish, native to southeast Asia. It is highly adapted to life in a seasonal tropical environment. It can tolerate very turbid and brackish water conditions; possesses an accessory air-breathing organ that enables it to survive out of water for several days; and uses its highly mobile suboperculum and strong fin spines to pull itself over land to move between bodies of water. The fish has the ability to aestivate during the dry season. If unable to access permanent sources of water at the end of the wet, it will bury itself into the mud of drying water bodies, to emerge with the onset of the next rains (Allen, 1991; Davenport & Abdul Matin, 1990; Department of Primary Industries & Fisheries, 2005; Forselius, 1957; Rahman, 1989; see also Froese & Pauly, 2007 for more information and references).

The species was introduced to Indonesia's Papua Province, in New Guinea, from elsewhere in the Indonesian archipelago, probably by transmigrants, who have brought this and other food fishes with them when settling the Province.



FIG. 1. *Anabas testudineus* on Saibai Island, 13 January 2006. Approx. total length 200mm. (Photo by Harry Yamashita).

It subsequently moved across the international border into Papua New Guinea (PNG), some time between the mid-1970s and mid-1980s, and has since spread rapidly eastward throughout coastal and riverine areas of southwest PNG (Allen, 1991: 215; Coates, 1989; Hitchcock, 2002; Storey et al., 2002; Miller et al., 1995; Swales et al., 1999).

Storey et al. (2002: 113) has highlighted how Climbing Perch's physiology, and local circumstances in Torres Strait, greatly increases the possibility of a successful deliberate or unintentional translocation of the fish into northern Australia:

"The ability of *A. testudineus* to stay alive out of water poses a possible threat to the north of Australia. It is feasible that *A. testudineus* could unintentionally be introduced to Cape York, the north-east point of Australia, through the frequent movement of small craft across the Torres Strait from PNG to Australia; *A. testudineus* may survive in the moist conditions in the bottom of a boat for several days and the distance across the Torres Strait may be covered in a few hours. Once present, *A. testudineus* would quickly become established in the abundant suitable habitat found in the wet tropics of northern and north-eastern Australia."

The establishment of this fish on Saibai Island is not surprising, as it is located only 4 km from the PNG coast. Introduction by visiting Papuans cannot be ruled out, and it is possible that it could have been translocated live from the PNG mainland by waterbirds or birds of prey; specimens of dead *A. testudineus* have been identified among fish regurgitated by Australian

Pelicans, *Pelecanus conspicillatus*, on Kerr Islet (9°37'S, 141°34'E) in Torres Strait, located 115 km westsouthwest of Saibai Island (Hitchcock, in press). However, a more parsimonious explanation is that the fish have been able to colonise the island as a result of a combination of environmental conditions. During the wet season, lower salinity levels prevail in northern Torres Strait, and a freshwater feature occurs along the PNG coast, due to outputs from PNG rivers, including the Fly (Ayukai & Wolanski, 1997; Pitcher et al., 2004). There are reports of heavy rainfall flushing Climbing Perch out of coastal rivers and creeks into Torres Strait. Lawrence (1995: 19) reports that an ebb tide at the PNG coastal village of Kadawa, situated northeast of Saibai Island, has left large numbers of *A. testudineus* flapping on the sand in front of this settlement.

Saibai Island is a low, muddy island, fringed by tidally inundated mangroves. The interior consists of seasonally inundated, fresh- and brackish-water sedge swamps, salt pans, and non-inundated claylands covered by grasslands and open woodland (see Barham, 1999; Barham & Harris, 1985; Environmental Science & Services, 1994). Climbing Perch have probably colonised Saibai Island via the system of mangrove creeks that connect the swamps to the sea, or king tides associated with the northwest monsoon, which flood low-lying areas. While most swamps are semi-permanent, several indigenous wells, and more recent water supply ponds and dams, retain fresh water throughout the dry season. Coupled

with the fish's ability to bury itself into mud, it seems likely that the Climbing Perch seen on Saibai Island are part of a viable, self-sustaining population.

IMPACTS AND CONTROL

Climbing Perch is known to kill some fish, waterfowl and reptile species that predate on it – its sharp spines becoming locked in the predator's throat or stomach (Lawrence, 1995; Miller et al., 1995; Storey et al., 2002). Like many other exotic introductions in Australia and New Guinea, it probably also competes with native fishes for space and food (Allen, 1991; Department of Primary Industries, 2001; Storey et al., 2002). Its potential impacts on the Saibai Island environment are unclear, as little is known about the island's fauna, however, the following native fish were collected from two freshwater locations close to where Climbing Perch were reported on the island (Queensland Museum catalogue numbers provided): *Megalops cyprinoides* QM I.38040, *Melanotaenia splendida rubrostriata* QM I.38037, *Ambassis agranmus* QM I.38038, *Anniataba candavittata* QM I.38039, QM I.38043, *Selenotoca multifasciata* QM I.38042 and *Bostrychus zonatus* QM I.38041. Fortunately, Torres Strait effectively serves as a natural barrier to the spread of Climbing Perch to islands to the south of Saibai Island, and to the Australian mainland.

QDPI&F has in place a strategy for the control of exotic pest fishes (Department of Primary Industries, 2001). A key goal of the strategy is preventing the establishment of additional noxious species in Queensland. The Department has alerted local authorities in Torres Strait (including AQIS staff) about Climbing Perch on Saibai Island, and is developing a plan to monitor and manage this latest alien incursion. While it may not be possible to eradicate the fish from Saibai Island itself, the potential for transmission by human vectors to the Australian mainland will require ongoing vigilance. Considerable movement of people occurs throughout Torres Strait. This includes cross-border visits by Papuans and Torres Strait Islanders under the terms of the Torres Strait Treaty between Australia and PNG (Department of Foreign Affairs & Trade, 1985), mostly by PNG nationals, from villages on the Western Province coast to Torres Strait Island communities, but also movement by Torres Strait Islanders to the Australian mainland, and temporary visits to outer islands by non-

Indigenous workers. The undetected arrival of a boat on western Cape York in January 2006, carrying asylum seekers from Indonesia's Papua Province, also highlights the potential, however low, for this species to be introduced directly to northern Australia by vessels originating from New Guinea.

The Australian Quarantine and Inspection Service (AQIS), through its Northern Australia Quarantine Strategy (NAQS), is charged with protecting northern Australia from animal and plant pests, and has a high profile in Torres Strait. On each Torres Strait community island, local AQIS officers ensure that people do not import or export prohibited items. Further, members of NAQS make regular patrols with their PNG counterparts along the PNG–Indonesian border. However, the focus of AQIS to date has been on exotic animals, insects, plants and diseases (see Thompson et al., 2003). While AQIS officers would seize and destroy this and other alien fish if they were detected being imported into Australia from PNG, responsibility for the natural dispersal and control/eradication of pest fish rests with QDPI&F (Shayne Ahboo, Manager Torres Strait and Northern Peninsula Area, NAQS, AQIS, pers. comm., May 2007).

Until recently, there was no national strategy to deal with exotic freshwater pest fish. However, the Vertebrate Pests Committee, an Australian/New Zealand government advisory group on pest animal management, has now expanded to include freshwater fish species, and in 2006 released a draft 'Australian Pest Animal Strategy' that includes fish (Agrans Research & Dawson, 2005; Vertebrate Pests Committee, 2006). Furthermore, a draft national strategy for ornamental fish released in 2005 (Marine & Coastal Committee, 2005) proposed listing *A. testudineus* as a noxious fish in all Australian jurisdictions. In November 2006 the Natural Resource Management Ministerial Council endorsed the final version of the strategy (National Resource Management Ministerial Council, in press), with Climbing Perch on the list of nationally agreed noxious species. It also outlines a national approach to managing the aquarium fish trade and dealing with associated pests and diseases (Bureau of Rural Sciences, 2007a). An Ornamental Fish Management Implementation Committee has recently been created to progress the strategy (Bureau of Rural Sciences, 2007b). It is to be hoped that these national, cross-jurisdictional policy and statutory initiatives will result in effective management outcomes,

including enhanced surveillance, detection and response.

Cooperation, liaison and planning at all levels (local, regional, state and Commonwealth), ongoing awareness training by QDPI&F for local AQIS officers and staff of Island Councils, and an educational campaign in Torres Strait and adjacent areas of Cape York, will be crucial to preventing the spread of this fish by human vectors to the Australian mainland.

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